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COMMONWEALTH OF AUSTRALIA

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**PATENT SPECIFICATION** (21) 5.192/66

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Lodged (22) 6th May, 1966.  
(Accompanied by a -  
Provisional Specification)

Complete Specification  
entitled (54) CONDUIT ARRANGEMENTS FOR FLOORS OF  
BUILDINGS.

Lodged (23) 11th April, 1967.  
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Convention Priority (30) -

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Actual Inventor (72) MARK NORTH.

Related Art (56)	213,936(15,950/56)	81.7; 81.2
	223,584(22,374/56)	81.4; 81.3; 81.2
	163,242(16,713/53)	81.4; 81.3.

The following statement is a full description of this invention, including the best method of performing it known to us:

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W. G. Murray, Government Printer, Canberra

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This invention relates to composite floors of buildings; that is, floors of the kind comprising a sheet metal decking having upstanding ribs running longitudinally thereof, and a layer of concrete (or reinforced concrete) which is poured directly on the decking. The ribs are usually of wedge or dove-tail shape so that the concrete will key between adjacent ribs.

When the concrete is poured, the decking acts as a form therefore, and when the floor is finished the decking, coated with a ceiling material or exposed on the underside of the floor, acts as a tensile reinforcement for the composite floor.

In such composite floors it is usual to provide conduits to house electrical cables and other items. Such conduits are, almost invariably, immersed within the concrete and usually consist of one or more header or main conduits which rest on the top faces of the decking ribs, and a number of branch conduits (usually called "raceways") on the decking portions or "flats" between the deck ribs; junction means being provided where the two kind of conduits meet to enable the necessary branching electrical or other connections to be made.

This invention is mainly concerned with branch conduits of the raceway type referred to above.

Hitherto the raceway conduits have usually consisted of inverted channels having outwardly projecting fixing flanges or strips along the free edges of the channel flanges by which the channels may be spot-welded or otherwise fixed to the decking flats between the ribs thereof. Such an arrangement has proved to be more-or-less satisfactory; but nevertheless is open to objection in

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several respects. For example:-

(a) It is a difficult matter to weld the channel fixing strips to the decking flats, because the weld points are necessarily well below the top level of the ribs and hence are not readily accessible. This is particularly inconvenient where a wide raceway almost entirely fills the space between adjacent ribs;

(b) Occasionally some of the concrete filling creeps between the decking flats and the lower edges of the fixing strips secured thereto. This can impair necessary electrical earthing of the conduits constituted by the channels and the flats to which they are secured;

(c) The inverted channels do not add to the thickness of the decking flats, and therefore, to comply with safety requirements for electrical conduits, the decking as a whole has to be made of a thicker sheet metal gauge than is structurally necessary; and,

(d) The raceway channels have to be located between the ribs by visual judgement, or by measuring, instead of being self locating relative to the ribs.

The object of this invention is to overcome the mentioned shortcomings, or some of them, in a very simple manner by the provision of a raceway conduit incorporating fixing means, which enable the channels to be fixed in position by welding, riveting or other fastening applied entirely at the upper level of the decking ribs; which ensures effective earthing of the raceway conduits even if concrete creep occurs; which, at least in the preferred embodiment of the invention, enable the decking sheets to be made out of a lighter gauge sheet metal than would otherwise be required; and which cause the channels to be correctly

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positioned by mere application of the fixing means without necessity for skill or judgement.

The invention is definable as follows:

A composite floor of the kind consisting of a sheet metal decking having upstanding ribs separated by flats, a layer of concrete laid on the decking, and at least one raceway conduit on a flat between two adjacent ribs; characterised in that said conduit and fixing means therefore comprise an inverted channel and at least one fixing strap which embraces the sides of said channel and includes side wings able to locate said channel relative to said adjacent ribs and fixing lugs to the tops of said adjacent ribs.

An example of the invention is illustrated in the drawings herewith.

Figure 1 is a perspective view of part of a composite floor comprising a sheet metal decking having ribs A separated by flats B, a layer of concrete C, and main conduits D with junction boxes E leading to raceway conduits F. This figure also shows a ceiling finish layer G applied to the underside of the decking.

Figure 2 is a perspective view showing part of a raceway conduit channel.

Figure 3 is a similar view of a floor plate which in use is preferably applied to the channel shown in Figure 2.

Figure 4 is an end elevation of the items shown in Figures 2 and 3 and fixing means therefore as applied to a decking sheet of the kind shown in Figure 1.

The illustrated raceway conduit comprises an inverted channel 5 having outwardly directed strip flanges 6, thereon. These strip flanges are embraced by hooked edge

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formations 7 on an otherwise flat floor plate 8 which, when the raceway is assembled rests directly on the upper face of the decking flat B to which it is applied. Thus to provide an extra thickness of sheet metal to give the conduit floor an effective thickness (that of the plate 8 plus that of the flat B) sufficient for electrical safety requirements. The conduit parts can be made out of sheet metal of any required thickness, for example, 24 gauge galvanised sheet steel.

The preferred form of fixing device comprises a strap which may be of similar steel but preferably of slightly thicker gauge (say 16 gauge). This strap may be, for example, from one inch or two inches wide. The strap is formed as an inverted channel 9 which will easily, but preferably neatly, fit over channel 5 so that the web of the strap lies over the web of the channel and the strap flanges 10 embrace the channel sides between them.

The extent to which the strap flanges 10 extend downwardly of the channel flanges is not critical, but for preference it is for virtually the full height of those flanges. The side wings 11 extend upwardly and divergently from the free edges of the strap flanges, so that the upper end portions of the wings are able to fit neatly, and hence locatingly, between the uppermost ends of the adjacent ribs A of the decking. The upper ends of the wings terminate in the mentioned fixing lugs 12 which are so disposed as to lie flatly on the tops of the decking ribs, thus enabling the lugs to be fixed to the rib tops by welding or otherwise.

It will be appreciated that the floor plate 8 and the strip flanges 6 could be omitted, but these items are preferably present as they permit the decking sheet to be made of thinner material than would otherwise be necessary for electrical safety purposes. 5

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The claims defining the  
invention are as follows:-

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1. A composite floor of the kind consisting of a sheet metal decking having upstanding ribs separated by flats, a layer of concrete laid on the decking, and at least one raceway conduit on a flat between two adjacent ribs; characterised in that said conduit and fixing means therefore comprise an inverted channel and at least one fixing strap which embraces the sides of said channel and includes side wings able to locate said channel relative to said adjacent ribs and fixing lugs secured to the tops of said adjacent ribs.
2. A floor according to Claim 1 which includes strip flanges on the lower ends of the flanges of said channel and a floor-plate secured to said strip flanges.
3. A floor according to Claim 1 or Claim 2 wherein said fixing strap includes strap flange portions which extend downwardly for substantially the full depth of the flanges of said channel and wherein said side wings extend upwardly and outwardly from the lower edges of said strap flange portions.
4. Conduit arrangements for composite floors substantially as herein described with reference to the drawings herewith.

THE CLAIMS DEFINING THE INVENTION ARE

DATED THIS 11th day of APRIL, 1967.

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SYDNEY



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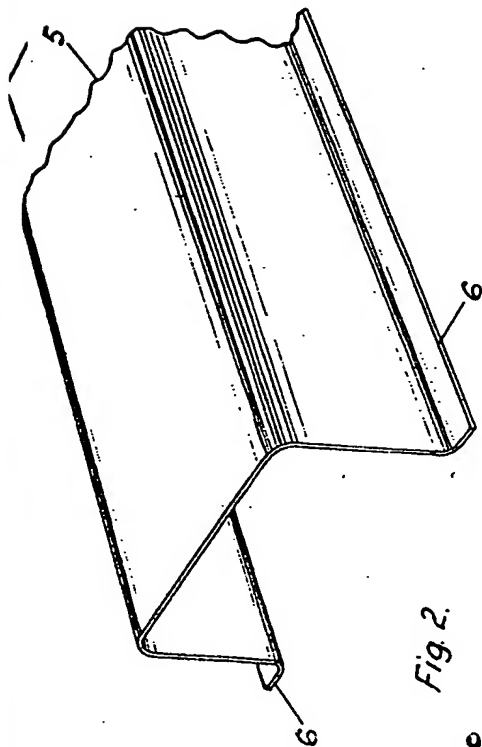


Fig. 2.

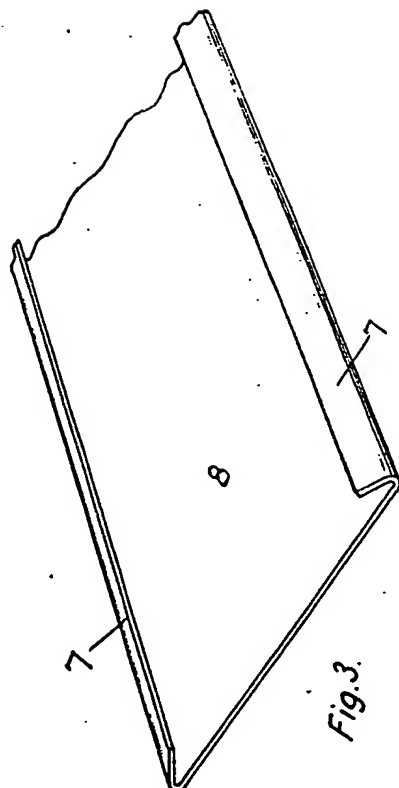


Fig. 3.

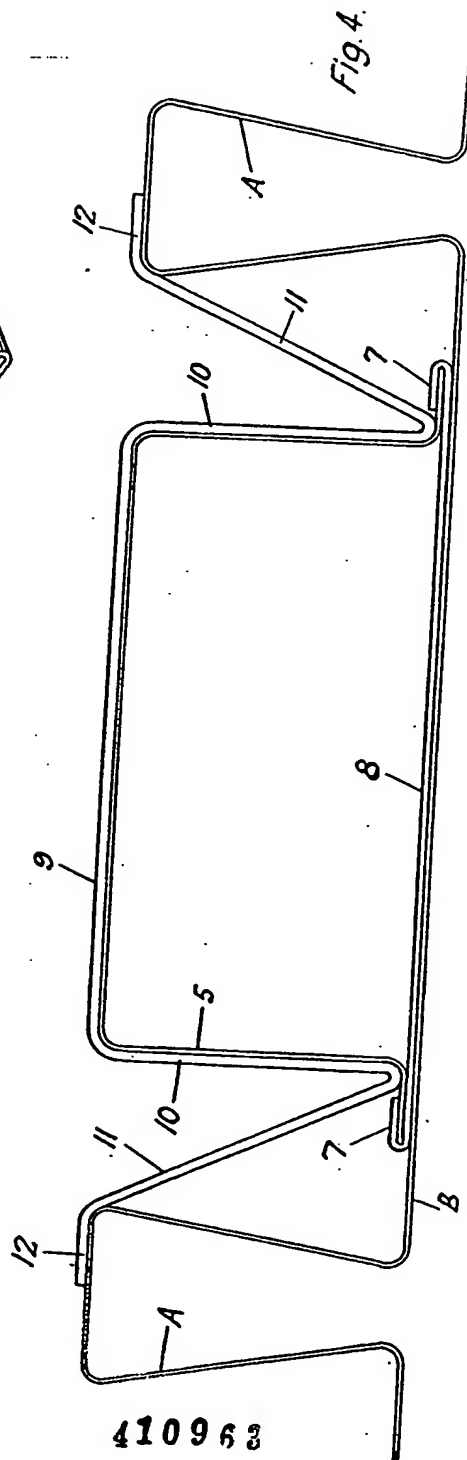


Fig. 4.

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